Proceedings of the American Mathematical Society 2013 vol.141 N9, pages 3275-3289

Limitwise monotonic sequences and degree spectra of structures

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Abstract

In this paper, we study effective monotonic approximations of sets and sequences of sets. We show that there is a sequence of sets which has no uniform computable monotonic approximation but has an x-computable monotonic approximation for every hyperimmune degree x. We also construct a ∑0 2 set which is not limitwise monotonic but is x-limitwise monotonic relative to every non-zero Δ0 2 degree x. We show that if a sequence of sets is uniformly limitwise monotonic in x for all except countably many degrees x, then it has to be uniformly limitwise monotonic. Finally, we apply these results to investigate degree spectra of abelian groups, equivalence relations, and ℵ1-categorical structures.

http://dx.doi.org/10.1090/S0002-9939-2013-11586-8